

RELATION OF CHRONIC ENVIRONMENTAL LEAD EXPOSURE TO DEPRESSION AND ANXIETY SYMPTOMS IN OLDER WOMEN

Ki-Do Eum, *Harvard School of Public Health, USA*

Susan A. Korrick, *Brigham and Women's Hospital and Harvard Medical School, USA*

Jennifer Weuve, *Rush University Medical Center, USA*

Olivia Okereke, *Brigham and Women's Hospital and Harvard Medical School, USA*

Laura Kubzansky, *Harvard School of Public Health, USA*

Howard Hu, *University of Michigan School of Public Health, USA*

Marc G. Weisskopf, *Harvard School of Public Health, USA*

Background and Aims: Environmental lead exposure has been associated with adverse cardiovascular and cognitive outcomes, which are themselves correlated with psychological symptoms. Yet few studies have examined links between lead exposure and psychological symptoms. We explored the association between bone lead—a biomarker of cumulative lead exposure—and depression and anxiety symptoms among older women.

Methods: We measured patella and tibia bone lead by K-X-Ray-Fluorescence, and obtained repeated measures of depression and anxiety symptoms using the Mental Health Index 5-item subscale (MHI-5) and Crown-Crisp Index phobic anxiety scale (CCI) in 615 women in the Nurses Health Study. We analyzed MHI scores as a continuous variable using linear regression and estimated the odds of a CCI score ≥ 4 using generalized estimating equations, in both cases accounting for correlation between repeated outcomes (MHI: 3; CCI: 2) and adjusting for potential confounders.

Results: The average age of participants was 61 (sd=6) years at the time of bone lead measurement. While tibia lead was associated with moderately worse MHI-5 and CCI scores among all women, results were much stronger among women who, at bone lead measurement, were premenopausal or had been consistently on hormone replacement therapy (HRT) since menopause. In these analyses, women in the highest tibia lead tertile scored 8.16 points worse (95% CI: -11.60, -4.72; p-trend<0.0001) on the MHI-5 than women in the lowest tertile, and had increased odds of high phobic anxiety (CCI ≥ 4 ; OR=2.41; 95% CI: 1.06-5.50; p-trend=0.04). We found no relation of patella lead to depression and anxiety symptoms.

Conclusions: Our results support an association of cumulative environmental lead exposure with increased risk of depression and anxiety symptoms among older women. Weaker results when including women not consistently on HRT after menopause may be an artifact of increased error in estimating cumulative exposure with bone lead among these women.